

# Transforming Data Center Cooling:

## Key Strategies for Effective EC Fan Solutions



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**Optimizing cooling systems is a critical focus for data centers, particularly as energy efficiency and sustainability take center stage.**

**Retrofitting legacy systems with advanced EC fan technology has emerged as a powerful strategy to reduce energy consumption, improve Power Usage Effectiveness (PUE), and align with environmental goals. However, executing such retrofits involves navigating a range of challenges that can derail even well-intentioned projects.**

**This article explores the common pitfalls encountered during EC fan system retrofits and highlights how Infinitum's Aircore EC motors offer innovative solutions to overcome these obstacles. Whether it's addressing harmonics, ensuring right-sizing, or enhancing serviceability, these insights will guide you in transforming your data center fans into a model of efficiency and reliability.**

## Top Mistakes in EC Fan Retrofits

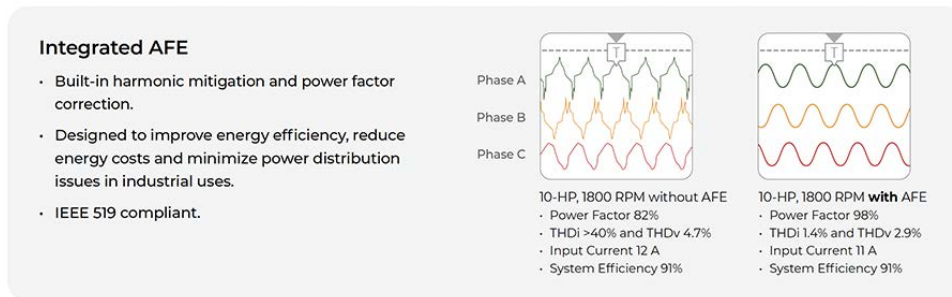
Retrofitting data center cooling systems with EC fan technology offers significant benefits, but it's a complex process fraught with potential pitfalls. Understanding these common mistakes is crucial for successful implementation and optimal performance of your data center fans.

### Underestimating Harmonics in Data Centers

Harmonics pose a significant challenge in EC fan retrofits for data centers. Many assume that EC motors automatically eliminate harmonics, but this is a dangerous misconception.

Poorly integrated motor retrofits can introduce harmful harmonics into the electrical system. These distortions can damage sensitive IT equipment and compromise data center reliability. In some cases, expensive mitigation gear becomes necessary to address the issue.

To avoid this pitfall, it's crucial to conduct a thorough harmonic analysis before implementation. Choosing EC motors with built-in harmonic mitigation, such as those featuring Active Front End (AFE) technology, can significantly reduce Total Harmonic Distortion (THD) and improve power factor. This proactive approach ensures power quality remains high without the need for additional costly filters or electrical equipment.



*AFE Technology for Cleaner, Smarter, Resilient Power*

## Right-Sizing for Optimal Airflow

Effective airflow management is critical in data center cooling, and right-sizing EC fan systems is key to achieving this balance. Many retrofits fail to account for actual airflow demand, leading to inefficiencies and potential cooling inadequacies.

Oversized systems waste energy, operating at lower efficiencies and consuming more power than necessary. Conversely, undersized systems struggle to maintain required temperatures, potentially compromising IT equipment reliability and uptime.

The solution lies in conducting a comprehensive airflow analysis before retrofitting. This assessment should consider factors such as IT load variations, rack densities, and future growth projections. Implementing EC motors with variable speed capabilities and integrated VFDs allows for precise control, enabling the system to dynamically adjust to changing IT loads and optimize Power Usage Effectiveness (PUE).

## Maintenance and Serviceability Challenges

In the 24/7 operational environment of data centers, maintenance and serviceability of cooling systems are paramount. Overlooking these aspects during EC fan retrofits can lead to increased downtime and operational disruptions.

Choosing EC motors that are difficult to service or require complete system shutdowns for repairs can negate the efficiency gains of the retrofit. It's essential to select motors designed with modular, easily serviceable components.



Consider motors that allow for quick part replacement and minimal maintenance requirements. Additionally, ensure that the chosen solution comes with robust support and readily available spare parts. This approach minimizes downtime risk and ensures the longevity and reliability of your data center cooling system.

### **Space and Weight Constraints**

Many older data centers were not designed to accommodate modern cooling equipment, making space and weight considerations crucial in retrofit projects. Failing to account for these constraints can lead to costly structural modifications or suboptimal installations.

EC fan retrofits often involve replacing legacy equipment with newer, potentially larger or heavier units. This can pose challenges in tight mechanical rooms or on floors with limited load-bearing capacity.

To address this, prioritize compact and lightweight EC motor solutions. The Infinitum Aircore EC motor design utilizes a modular design that is significantly lighter than traditional motors, in a small footprint. This characteristic not only simplifies installation but also reduces the need for expensive structural alterations, making the retrofit process more cost-effective and less disruptive.

### **Aligning with Sustainability Goals**

EC fan retrofits should be viewed not just as maintenance projects, but as strategic initiatives that drive corporate Environmental, Social, and Governance (ESG) and net-zero goals. Failing to align these projects with broader sustainability objectives is a missed opportunity.

Well-executed EC fan retrofits can deliver measurable Scope 2 emissions reductions, a key metric in sustainability reporting. They contribute significantly to improving overall data center energy efficiency and reducing carbon footprint.

When planning retrofits, consider solutions that offer both immediate energy savings and long-term sustainability benefits. Look for EC motors that not only improve efficiency but also incorporate sustainable design principles, such as using less raw materials or offering remanufacturing options. This approach ensures that your retrofit project not only cuts operational expenses but also advances your organization's ESG progress in a tangible, reportable manner.